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ABSTRACT

The National Center for Health Services Research and Health Care Technology Assessment conducted a study to examine how Americans use health care services and to determine national patterns of health expenditures and insurance coverage. Data were obtained from the National Medical Care Expenditure Survey interviews conducted with 14,000 randomly selected households at 6 times over an 18-month period during 1977 and 1978. Data were analyzed to determine annual expenses for personal health services and mean health care expense per person by selected demographic and socioeconomic characteristics. The data showed that inpatient hospital and physician care consumed almost 60% of expenditures during 1977. Persons with expense spent \$594 on the average for health services, with the family and private insurance together assuming almost two-thirds of the cost. On an individual basis, females of all ages incurred a higher percentage of out-of-pocket expense than did males. Mean expense per person with personal health care expenditures was also higher than the \$594 national average for blacks, for those with family incomes below \$12,000, and for persons living in the Northeast and the West. Between 1970 and 1977, increases in health care expenditures after adjustment for health care price inflation were particularly noticeable for the population age 55 and older and for the inpatient component of services. (Author/NB)

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NCHSR**National Health Care
Expenditures Study**

A Summary of Expenditures and Sources of Payment for Personal Health Services From the National Medical Care Expenditure Survey

Data Preview 24

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Center for Health Services Research
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Background of the study

Judith A. Kasper, Ph.D., a sociologist, and Louis F. Rossiter, an economist, were senior researchers in the Division of Intramural Research, NCHSR. Renate Wilson is the associate editor of the National Health Care Expenditures Study publications series.

Information on the National Health Care Expenditures Study is available from: Daniel C. Waiden, Ph.D., Senior Research Manager, National Center for Health Services Research and Health Care Technology Assessment, 18A-55 Parklawn Building, Rockville, MD 20857, 301/443-4836.

Data from the National Health Care Expenditures Study are available as the following public use tapes from the National Technical Information Service, Springfield, VA 22161: National Medical Care Expenditure Survey Household Data, Person Records SAS File (PB83-198077) and Person Records EBCDIC File (PB83-199539); Hospital, Physician, Nonphysician, and Dental Event Records SAS Files (PB85-246619) and EBCDIC Files (PB85-246635); Prescribed Medicines, Vision Aids, and Medical Equipment and Supplies Event Records SAS Files (PB85-246627) and EBCDIC Files (PB85-246643); NMCES Health Insurance/Employer Survey Data, Private Health Insurance Coverage Status, Premiums, and Sources of Payment, and Private Insurance Benefits of the Population Age 65 and Older, SAS Files (PB86-194669) and EBCDIC Files (PB86-194685). Benefit data from the NMCES Health Insurance/Employer Survey for persons under age 65 will be available in 1987.

Examining how Americans use health care services and determining national patterns of health expenditures and insurance coverage are the goals of a landmark study by the National Center for Health Services Research and Health Care Technology Assessment. The National Health Care Expenditures Study (NHCES) is a major component of the Center's Intramural Research Program. NHCES has provided information on a number of critical issues of national health policy. Topics of particular interest to government agencies, legislative bodies, health professionals, and others concerned with health care policies and expenditures include:

- The cost, utilization, and budgetary implications of changes in Federal financing programs for health care and of alternatives to the present structure of private health insurance
- The breadth and depth of health insurance coverage
- The proportion of health care costs paid by various insurance mechanisms
- The influence of Medicare and Medicaid programs on the use and costs of medical care
- How and why Medicaid participation changes over time
- Patterns of use and expenditures as well as sources of payment for major components of care
- The cost and effectiveness of Federal, State, and local programs aimed at improving access to care
- The loss of revenue resulting from previous tax treatment of medical and health insurance expenses, particularly with regard to the benefits currently accruing to different categories of individuals and employers, and the potential effects on the Federal budget of proposed changes to tax laws
- How costs of care vary according to diagnostic categories and treatment settings.

The data for these studies were obtained in the National Medical Care Expenditure Survey (NMCES), which has provided the most comprehensive statistical picture to date of how health services are used and paid for in the United States. The survey was completed in September 1979.

Data were obtained in three separate, complementary stages. About 14,000 randomly selected households in the civilian noninstitutionalized population were interviewed 6 times over an 18-month period during 1977 and 1978. This survey was complemented by additional surveys of physicians and health care facilities providing care to household members during 1977 and of employers and insurance companies responsible for their insurance coverage.

Funding for NMCES was provided by the Center, which cosponsored the survey with the National Center for Health Statistics.

Data collection for the survey was done by Research Triangle Institute, NC, and its subcontractors, National Opinion Research Center of the University of Chicago, and Abt Associates, Inc., Cambridge, MA, under contract HRA 230-76-0268. Data processing support was provided by Social and Scientific Systems, Inc., Bethesda, MD, under contracts 233-79-3022 and 233-80-3012.

This report is one of a Data Preview series presenting estimates of several key measures of health services use, expenditures and private health insurance coverage. The series also has provided estimates of the use of and expenditures for ambulatory services provided by physicians and other health care professionals, inpatient hospital services, dental services, and prescribed medicines.

Even though NMCES was designed to meet specific research goals, NCHSR is making the information collected in these surveys available to researchers and other interested persons through public use tapes.

A Summary of Expenditures and Sources of Payment for Personal Health Services From the National Medical Care Expenditure Survey

Judith A. Kasper, Louis F. Rossiter and Renate Wilson

Much of the current concern over health care expenditures is based on their implications for outlays from public sources, particularly through the Medicare and Medicaid programs. By the end of the 1970s, government programs financed 43 percent of all personal health care in the United States, or almost twice the proportion during the years prior to the inauguration of Medicare and Medicaid (Gibson, 1980). But public expenditures are not the only issue. There is considerable interest in the levels of benefit payments by private insurance companies, and the out-of-pocket expense by consumers of health care remain of concern, particularly for people who are in poor health, or uninsured, with only inadequate coverage.

This final expenditure report from the National Health Care Expenditures Study (NHCES) summarizes annual expenses for personal health services by the noninstitutionalized civilian population. The report builds upon previous publications in this series on expenditures for 1977 for hospital, ambulatory physician, dental, vision, and other services (see the end of the report for a complete listing of publications from the National Health Care Expenditures Study). The data comprise estimates of total mean expense and sources of payment per person by age, sex, and health status as well as the distribution of families and of type of expense by level of expense and source of payment. Data on out-of-pocket premiums from the NHCES Health Insurance/Employer Survey have been included to provide an indication of total family outlays for health care as a percent of income. Finally, 1977 data on expenditures are compared with comparable data for 1953, 1963, and 1970 from Andersen, Lion, and Anderson (1976). (See the Data Sources and Methods of Estimation section for additional information on these data. The Technical Notes describe sampling information and standard error estimates that must be considered in assessing the confidence levels of the national estimates presented.)

Expenditures and Sources of Payment

Annual expenses

Over four-fifths of the civilian noninstitutionalized population (85 percent; Table 1) used some type of personal health service during 1977. The percentage of those who went without any type of personal health care was relatively high for the

young (6 to 24 years), males, blacks and Hispanics, those at low levels of income and education, and persons living in the South.

Average expense per capita (excluding health insurance premiums) and per person with expense were \$499 and \$594, respectively. Only 1 percent of users incurred no expense. Mean per capita expense was more than twice the national average for persons 65 years and older and less than half this average for those below age 19. Mean expenditures per person with expense were comparable by sex and race, as were expenditures by place of residence and U.S. Census region. Substantial differences existed by income and education, the highest expenses being incurred by the least educated and those with annual family incomes below \$12,000. (Many low-income persons in the least educated population segment are elderly; this, as well as the prevalence in these groups of more persons with poor health status, may contribute to their higher aggregate levels of expenditures.)

The relationship between health status, age, income, and levels of expenditures suggested by Table 1 is substantiated in Tables 2 and 3. Mean health care expenses by those using services were up to five times as high for those in poor health as for those in excellent health in the age groups under 65 (Table 2); the difference was more than twofold even among the elderly, who generally incur higher expenditures than younger age groups. Table 3 suggests, furthermore, that there was considerable disparity in perceived health status by income, regardless of age, and that the risk of incurring high annual expenditures for health care fell disproportionately on the low-income groups. On average, persons in the lowest income group were substantially more likely to be in only fair or poor health than persons in higher income groups (20.5 percent compared to 13.0 and 9.0 percent, respectively), and this disparity was considerable in all age groups. Of the 4.5 million persons aged 55 to 64 and with low incomes, as many as 43 percent were in only fair or poor health, compared to 18 percent of the 8.9 million in this age group with high incomes. Among low-income persons aged 65 or older, who made up half of this age group, 39 percent were in fair or poor health, compared with 21 percent of those with high incomes. This pattern held true among the young as well, where 10.3 percent of low-income children but only 3.9 percent of middle-income children were in less than good health.

Expenses by type of service

Mean expenditures for health services per person with expense in 1977 were \$594 for the 178.2 million persons with expense (Table 4), or a total of \$106 billion. Inpatient hospital services accounted for more than half of expenditures (57 percent or a

mean of \$1,970 for room and board and \$682 for inpatient physician services for those with expenses for inpatient stays). Roughly a quarter of total expenditures went for ambulatory physician and nonphysician services and prescribed medicines. Expenses for dental care, eye glasses and contact lenses, and medical equipment and supplies accounted for the remainder.

Table 1. Annual expenses for personal health services: Percent of persons with and without expense and means per person and per person with expense (United States, 1977).

Population characteristics	Total population	No use of services	Use, no expense	Use, with expense	Expense per capita	Expense per person with expense
	Thousands	Percent distribution			Mean	
Total^a	212,098	15.0	1.0	84.0	\$499	\$594
Age in years						
Less than 6	18,179	11.8	1.2	87.0	231	265
6 to 18	50,626	17.8	1.2	81.0	220	271
19 to 24	22,307	18.4	1.1	80.5	366	455
25 to 54	78,505	14.9	0.9	84.2	494	587
55 to 64	20,203	12.3	0.6	87.1	844	969
65 or older	22,278	10.6	0.6	88.8	1,194	1,345
Sex						
Male	102,602	18.3	1.1	80.6	457	567
Female	109,496	11.9	0.8	87.3	539	618
Ethnic/racial background						
White	147,239	10.0	0.8	89.2	497	557
Black	19,573	23.8	0.9	75.3	469	623
Hispanic	8,821	18.1	1.0	80.9	450	556
Family income						
Less than \$12,000	75,533	18.7	1.2	80.1	605	756
\$12,000 to \$19,999	56,172	14.0	0.9	85.1	448	527
\$20,000 or more	79,807	12.2	0.8	87.0	435	500
Education of family head						
Less than 9 years	40,197	20.2	0.9	78.9	637	806
9 to 11 years	34,053	18.1	0.8	81.1	479	591
12 years	68,280	13.9	0.9	85.2	451	530
13 to 15 years	27,752	11.7	1.0	87.3	471	539
16 or more years	32,537	9.2	1.6	89.2	465	521
Place of residence						
SMSA	147,419	15.0	1.1	83.9	521	621
Other	64,679	14.8	1.0	84.2	450	534
U.S. Census region						
Northeast	47,137	14.2	1.0	84.8	560	660
North Central	58,039	13.0	0.8	86.2	473	548
South	67,357	17.4	1.0	81.6	458	562
West	39,565	14.6	1.3	84.1	537	638

^a Includes all other ethnic/racial groups not shown separately and persons with unknown ethnic/racial background, negative income, or in families where the education of the family head was unknown.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

A breakdown of expenses for each type of service by selected population characteristics (Table 5) shows that inpatient hospital and physician services represented 71 percent of all expenditures for persons 65 or older and two-thirds of expenditures for blacks and persons at low levels of income and education. Corresponding expenditures for the young (ages 6 to 24) and inpatient hospital expenses for persons at high income and educational levels were well below the national average.

Ambulatory physician care, the next largest type of expense overall, accounted for almost one-third of all personal health care expenditures for children under 6 years, but for only about one-sixth of all expenses for persons above age 55 and for the least educated. Expenditures for prescribed medicines and for nonphysician and other services (vision aids and medical equipment and sundries) took a relatively small share of the total and did not vary by population characteristics.

Expenses for dental services represented as much as one-third of all health care expenditures for those 6 to 18 years of age. This type of expense increased by income and education; for blacks, dental care represented only half as much in proportion as observed for whites.

Lower than average hospital expenses but higher ambulatory physician expenses as a percent of total expenses were observed in the aggregate in the Western U.S. Census region, although inpatient physician expenses were comparable to those elsewhere.

Levels of individual and family expense and sources of payment

The distribution of health care expenses by levels of annual expense indicates that 15 percent of individuals used no personal health services in 1977, one-third had expenses of less than \$100, and about 10 percent incurred expenses of \$1,000 or more (Table 6). The percent with low expenditure levels decreased with age (see also Tables 2 and 3), and only a fifth of persons 65 or older had expenses of less than \$100, compared to half of children under age 6 and 44 percent ages 6 to 18.

The reverse was observed for high levels of expenditures. Personal health care expenses of \$1,000 or more were incurred by only about 5 percent of those aged 18 years or less but by over 20 percent of persons 65 or older. Compared to the differences by age, there was little variation in expenditure level by other population characteristics.

At the household level (Table 7), a little over a third of all families had expenditures between \$250 and \$999. Expenses above this level were incurred by only 16 percent of families headed by adults under age 25. Half of young families had expenses under \$250, compared to just over one-fourth of families headed by persons 25 or older. Families headed by females tended to have lower levels of expenditures than families headed by males (37.4 percent fell below \$250, compared to

Table 2. Annual expenses for personal health services and perceived health status: Mean per person with expense by age (United States, 1977).

Age	Perceived health status			
	Excellent	Good	Fair	Poor
Persons with expense (thousands)^a	77,756	65,827	19,793	6,632
Total	Mean expense \$383	\$582	\$999	\$1,878
Age in years				
Less than 6	160	280	612	433
6 to 18	254	262	402	892
19 to 24	371	455	790	1,408
25 to 54	435	574	844	1,753
55 to 64	576	769	1,241	2,216
65 and older	832	1,329	1,441	2,172

^a Excludes persons with unknown health status.

Source: National Center for Health Services Research and Health Care Technology Assessment. NM/CES Household Survey.

25.6 percent for families headed by males). This may be attributable in part to the fact that in 1977, 78.1 percent of all families headed by females consisted of at most two persons, and 59.3 percent of one person only; for families with male household heads the corresponding figures were 46.1 percent and 14.5 percent (data not shown).

Differences in family expenditure levels by ethnic/racial group and education showed no clear pat-

tern, although families with the least educated heads were more likely to have had expenditures of \$2,500 or more. This may reflect the greater likelihood that family heads with only limited formal education tend to belong to the older age groups and thus are more likely to incur the high expenditures for health services typical of the elderly.

The out-of-pocket expense incurred by the families of those using services reflect not only

Table 3. Annual health care expenses, health status, and income: Percent of population in good or poor health and mean expense per person, by age and income (United States, 1977).

Income and age	Total population ^a	Proportion of income group within age category	Percent of population in excellent/good health	Mean expense per person in excellent/good health	Percent of population in fair/poor health	Mean expense per person in fair/poor health
	Thousands		Percent		Percent	
Income group^b						
Low	66,083	—	79.5	\$520	20.5	\$1,259
Middle	74,850	—	87.0	429	13.0	1,174
High	61,050	—	90.5	489	9.0	1,208
Age in years by income						
Less than 6						
Low	6,135	0.09	89.7	223	10.3	347
Middle	5,988	0.08	96.1	207	3.9	*1,304
High	2,403	0.04	97.0	183	3.0	*436
6 to 18						
Low	18,611	0.28	91.0	237	9.0	562
Middle	19,231	0.26	94.4	245	5.6	371
High	10,912	0.18	96.7	301	3.3	425
19 to 24						
Low	7,539	0.11	88.3	458	11.7	891
Middle	7,870	0.11	91.3	440	8.7	*1,058
High	6,134	0.10	95.1	320	4.9	*667
25 to 34						
Low	18,587	0.28	77.0	532	23.0	1,132
Middle	29,143	0.33	87.0	469	13.0	995
High	28,374	0.46	91.0	511	9.0	1,091
55 to 64						
Low	4,454	0.07	56.9	905	43.1	1,626
Middle	6,281	0.08	68.0	663	32.0	1,591
High	8,867	0.15	81.8	651	18.2	1,378
65 or older						
Low	10,758	0.16	61.0	1,266	39.0	1,660
Middle	6,337	0.08	69.2	1,007	30.8	1,537
High	4,360	0.07	78.7	1,043	21.3	1,770

^a Excludes persons with negative income or unknown health status. ^b Based on relationship of income to the poverty level, which adjusts income for family size. Low income: less than 2 times the poverty level. Middle income: between 2 and less than 4 times the poverty level. High income: at or greater than 4 times the poverty level. * Relative standard error greater than 30 percent. — Not applicable.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMES Household Survey.

different levels of risk of use but some of the differences in health insurance coverage that are related to the age and sex of the household head and to other characteristics associated with the fact and type of employment (see Farley, 1985 and 1986, for estimates of health insurance coverage from NMCES.) Overall, about a third each of total expenses was paid out of pocket and by private health insurance for both individuals and families (Tables 8 and 9); 15 percent was paid by Medicare and 9 percent by Medicaid. Medicare paid half of expenses for those 65 and older and a quarter for those at the lowest level of income and education. Medicaid paid a fifth of expenses for young children.

On an individual basis (Table 8), females of all ages incurred a higher percentage of out-of-pocket expenses than males and had a slightly higher Medicaid share, while relative levels of Medicare funding were similar. For families headed by women (Table 9), however, out-of-pocket expenses were only 5 percentage points lower than in families headed by men, but the contribution from Medicare and Medicaid was 27 percentage points higher. This offset the smaller share assumed by private insurance in these families (20 percent as compared to 39 percent in families with male heads).

These different patterns of reimbursement suggest the greater availability of employment-related private insurance to men and the greater likelihood that female heads of household will meet the eligibility criteria for Medicaid. Sixty-four percent of women under age 65 and on Medicaid gain this eligibility through Aid to Families with Dependent

Children (AFDC), which includes Medicaid coverage among its benefits (Kasper, 1986).

With the exception of these gender differences which, as noted, are largely related to access to private insurance through employment, patterns of payment were quite similar for families and individuals. Differences among population groups likewise reflected differences in access to private health insurance: blacks and Hispanics received more Medicaid funding and less reimbursement through private insurance than whites. Medicaid and Medicare covered 40 percent of expenses for the lowest income group while private insurance paid over 40 percent of the expenses for those in higher income groups and only 20 percent for low-income families. The distribution of sources of payment by education was similar. Out-of-pocket payments as a share of total expense were higher for those at high income and educational levels as well as for whites, but absolute dollar outlays tended to be similar within population categories because of higher expenses per person with expense among blacks and people with low income and education.

Public and private sources of payment differed by place of residence and U.S. Census region (see Table 8). Persons living in SMSAs received more in private insurance benefits as a percent of total payments, as did those living in the Northeast and North Central regions compared to the South and West. Persons in the South bore the highest proportion of expenses out of pocket, while Medicaid funding was highest in the West.

Table 4. Distribution of annual expenses for personal health services: Mean per person with expense by type of service (United States, 1977).

Type of expense	Persons with expense Thousands	Mean per person with expense
All health services ^a	178,217	\$594
Ambulatory physician services	149,006	140
Ambulatory nonphysician services	41,149	94
Inpatient hospital services	23,165	1,970
Inpatient physician services	22,411	682
Dental services	84,822	137
Prescribed medicines	120,309	46
Eyeglasses and contact lenses	21,553	76
Medical equipment and supplies	12,919	71

^a Includes other hospital-related expenses, such as transportation or special nurses, not shown separately.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

A summary of the sources of payment for total family expenses by type of service indicates that the relative contributions of private insurance, public programs, and the family largely reflect the

benefit structure of both public programs and private health insurance. Private insurance and Medicare are heavily oriented towards the coverage of inpatient hospital expenses, paying a relatively

Table 5. Annual expenses for personal health services: Mean per person with expense and percent distribution of expense by type of service (United States 1977).

Population characteristics	Total population with expense	Mean expense per person with expense	Type of service						
			Inpatient hospital services	Inpatient physician services	Ambulatory physician contacts	Dental services	Ambulatory nonphysician contacts	Out of hospital prescribed medicines	Other ^a
Total^b	Thousands		Percent distribution of expense						
	178,217	\$594	43	14	20	11	3	5	3
Age in years									
Less than 6	15,809	265	45	12	30	3	*3	*6	*2
6 to 18	41,019	271	24	9	25	32	4	4	3
19 to 24	17,946	455	37	13	25	14	*4	4	*3
25 to 54	66,072	587	39	15	22	12	4	5	3
55 to 64	17,595	969	49	15	16	7	3	6	3
65 or older	19,777	1,345	56	15	14	3	4	6	3
Sex									
Male	82,656	567	45	14	19	11	4	5	3
Female	95,561	618	41	15	20	11	4	6	3
Ethnic/racial background									
White	131,383	556	41	15	20	12	4	6	3
Black	14,737	623	54	14	18	6	*2	5	*2
Hispanic	7,140	556	43	14	24	9	*3	*4	*3
Family income									
Less than \$12,000	60,470	756	51	15	18	7	3	5	3
\$12,000 to \$19,999	47,777	527	41	16	20	11	3	5	3
\$20,000 or more	69,456	500	36	14	22	17	4	5	3
Education of family head									
Less than 9 years	31,731	806	54	15	16	5	3	6	2
9 to 11 years	27,612	591	45	14	21	9	4	5	3
12 years	58,148	530	41	16	20	12	3	5	3
13 to 15 years	24,236	539	37	14	22	15	4	5	4
16 or more years	29,038	521	34	12	23	19	5	5	3
Place of residence									
SMSA	123,752	621	43	15	19	12	4	5	3
Other	54,465	534	46	15	17	10	3	6	3
U.S. Census region									
Northeast	39,972	660	46	13	18	12	3	4	3
North Central	50,016	548	45	14	17	11	3	5	3
South	54,937	562	45	16	18	9	3	7	3
West	33,293	638	36	16	22	13	4	5	3

^a Includes expenditures for the purchase or repair of eyeglasses and contact lenses or the purchase or rental of other medical equipment and supplies. ^b Includes all other ethnic/racial groups not shown separately, and persons with unknown ethnic/racial background, negative income and in families where education of head was unknown. * Relative standard error is equal to greater than 30 percent.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

high proportion of expenses for covered families whose annual expenditures were above \$2,500 (Table 10). Many of these families probably had inpatient hospital expenses; in fact, as shown in Table 11, private health insurance and Medicare were the largest payers (43 percent and 25 percent,

respectively) for these services. Families with inpatient hospital expenses paid only 9 percent of the charges out of pocket.

By contrast, the roughly 90 percent of U.S. families with expenses for outpatient physician services and for prescribed medicines—\$237 and \$85 on

Table 6. Individual expenses for personal health services: Percent distribution of persons with and without expense, by intervals of annual expense (United States, 1977).

Population characteristics	Total population	Annual individual expenses					No use of services
		Less than \$100 ^a	\$100-\$249	\$250-\$999	\$1,000-\$2,499	\$2,500 or more	
	Thousands	Percent distribution					
Total^b	212,098	33.5	21.5	19.6	6.4	4.1	15.0
Age in years							
Under 6	18,179	51.3	23.2	9.3	3.2	1.2	11.8
6-18	50,626	43.8	20.2	13.5	3.9	0.9	17.8
19-24	22,307	32.7	21.1	18.2	7.2	2.4	18.4
25-54	78,505	29.9	21.9	21.9	7.1	4.3	14.9
55-64	20,203	22.0	22.6	27.2	8.2	7.7	12.3
65 or older	22,278	19.3	21.3	28.0	9.3	11.5	10.6
Sex							
Male	102,602	36.0	20.4	16.8	4.9	3.6	18.3
Female	109,496	31.1	22.6	22.1	7.8	4.5	11.9
Ethnic/racial background							
White	147,239	34.6	23.6	21.3	6.6	3.9	10.0
Black	19,573	35.5	17.0	13.5	6.2	4.0	23.8
Hispanic	8,821	36.0	18.9	17.4	5.0	3.6	18.1
Family income							
Less than \$12,000	75,533	31.2	19.1	18.9	6.7	5.4	18.7
\$12,000 to \$19,999	56,172	35.9	22.1	18.1	6.2	3.7	14.0
\$20,000 or more	79,807	33.8	23.5	21.2	6.2	3.1	12.2
Education of family head							
Less than 9 years	40,197	30.2	19.4	17.9	6.4	5.8	20.2
9 to 11 years	34,053	34.3	19.1	18.4	6.1	4.0	18.1
12 years	68,280	35.3	22.3	18.7	6.1	3.7	13.9
13 to 15 years	27,752	33.4	23.2	21.2	7.2	3.2	11.7
16 or more years	32,537	32.9	24.1	23.8	6.4	3.5	9.2
Place of residence							
SMSA	147,419	31.9	21.5	20.6	6.7	4.2	15.0
Other	64,679	37.1	21.6	17.2	5.6	3.7	14.8
U.S. Census region							
Northeast	47,137	32.1	21.7	20.2	6.8	5.0	14.2
North Central	58,039	36.9	21.9	18.4	6.0	3.8	13.0
South	67,357	34.6	20.5	17.6	6.1	3.7	17.4
West	39,565	28.0	22.6	23.9	6.9	4.0	14.6

^a Includes persons without expenses because all services were provided at no charge. ^b Includes all other ethnic/racial groups not shown separately, and persons with unknown ethnic/racial background, negative income, and in families where education of head was unknown.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCS Household Survey.

average per family—paid 49 and 73 percent, respectively, out of pocket for these services. Dental services as well required a considerable out-of-pocket share (72 percent of an average family expense of \$249).

In addition to the high share of inpatient physician charges (41 percent), private insurance paid 36 percent of expenses for outpatient hospital services and 29 percent for other ambulatory physician care. The Medicare share of health care expenses was lower for outpatient than for inpatient care, while Medicaid paid a similar proportion for physician and hospital services regardless of site of care. This reflects both the range of health care needs of the different segments of the Medicaid

population and the wider range of service coverage of this program compared to Medicare.

Total health care outlays

As shown in Table 10, in 1977 about 30 percent of U.S. families with health care expenses had total expenses below \$250 a year, another 37 percent had expenses from \$250 to \$999, and 14.1 percent had expenses of \$2,500 or more. While overall the family bore 31 percent of total expenses, those at low levels of expense paid a much higher percentage out of pocket—as much as 70 to 74 percent for those with expenses of \$250 or less. Families

Table 7. Family expenses for personal health services: Percent distribution of families with and without expense, by intervals of annual expense (United States, 1977).

Characteristics of family head	Total population Thousands	Annual family expenses					No use of services
		Less than \$100 ^a	\$100-\$249	\$250-\$999	\$1,000-\$2,499	\$2,500 or more	
		Percent distribution					
Total^b	79,663	12.6	16.1	35.2	17.8	13.3	4.9
Age in years							
19 to 24	8,418	27.4	22.6	27.0	11.1	4.5	7.3
25 to 54	43,137	10.8	15.5	36.8	20.6	12.4	4.0
55 to 64	12,345	9.9	14.4	36.9	16.9	17.0	5.0
65 or older	15,340	11.6	15.4	34.8	14.4	18.2	5.6
Sex							
Male	58,751	11.2	14.4	36.3	19.7	13.8	4.6
Female	20,911	16.6	20.8	32.6	12.4	12.0	5.6
Ethnic/racial background							
White	57,195	11.5	16.0	37.4	18.8	13.6	2.8
Black	6,870	14.1	17.7	32.6	15.4	13.6	6.4
Hispanic	2,677	10.8	17.8	32.9	23.3	11.4	3.7
Family income							
Less than \$12,000	36,479	17.2	18.7	30.6	13.2	12.4	7.9
\$12,000 to \$19,999	19,158	10.9	15.5	37.6	19.4	13.7	3.0
\$20,000 or more	23,787	6.9	12.6	40.8	23.5	14.5	1.7
Education							
Less than 9 years	15,745	11.8	16.7	33.2	15.8	16.1	6.3
9 to 11 years	12,663	12.8	17.2	34.0	17.2	13.4	5.3
12 years	24,212	12.1	15.5	36.7	18.1	13.3	4.3
13 to 15 years	10,996	13.9	16.4	36.6	17.8	11.3	4.0
16 or more years	11,805	12.1	14.3	36.4	21.7	12.3	3.2

^a Includes families without expenses because all services were provided at no charge. ^b Includes families headed by persons of other ethnic/racial groups, of unknown ethnic racial background, with negative income, and with unknown education.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCS Household Survey.

whose total annual health care expense exceeded \$2,500 paid only 19 percent out of pocket. The burden of high levels of expense was, on average, largely absorbed by reimbursements from private insurance and public program payments, both in

terms of total family expenditures and of specific services.

Nonetheless, particularly when considered as a percentage of annual family income, the remaining out-of-pocket cost of care was unevenly distributed

Table 8. Annual individual expenses and sources of payment for personal health services: Mean expense per person with expense and percent paid by source of payment (United States, 1977).

Population characteristics	Total population with expense	Mean expense per person with expense	Source of payment				
			Family	Private health insurance	Medicare	Medicaid	Other ^b
			Percent distribution				
Total^a	178,217	\$594	31	34	15	9	11
Age in years							
Less than 6	15,809	265	30	36	0	21	12
6 to 18	41,019	271	46	33	1	11	9
19 to 24	17,946	455	36	36	0	13	15
25 to 54	66,072	587	32	47	1	7	13
55 to 64	17,595	969	28	43	8	8	13
65 or older	19,777	1,345	23	11	52	7	8
Sex							
Male	82,656	567	27	35	16	6	15
Female	95,561	618	34	34	14	10	8
Ethnic/racial background							
White	131,382	556	33	37	14	6	11
Black	14,737	623	22	28	11	25	14
Hispanic	7,140	556	26	29	10	24	10
Family income							
Less than \$12,000	60,470	756	26	21	24	16	13
\$12,000 to \$19,999	47,777	527	33	43	9	4	10
\$20,000 or more	69,456	500	35	46	6	2	11
Education of family head							
Less than 9 years	31,731	806	24	21	25	17	12
9 to 11 years	27,612	591	29	33	14	12	13
12 years	58,148	530	31	43	10	6	10
13 to 15 years	24,236	539	35	39	10	3	13
16 or more years	29,038	521	41	37	12	1	9
Place of residence							
MSA	123,752	621	30	36	14	9	11
Other	54,465	534	32	31	16	8	13
U.S. Census region							
West	39,972	660	29	38	16	8	9
Central	50,016	548	29	42	13	7	9
South	54,937	562	34	29	15	8	13
North	33,293	638	31	28	15	11	14

^a other ethnic/racial groups not shown separately and persons with unknown ethnic, racial background, negative income, or in the military. ^b Includes CHAMPUS/CHAMPVA, the Indian Health Service, the Veterans Administration, other federal, state, city or county payers, philanthropic institutions, and unknown sources of payment. 0 indicates less than 0.05 percent.

Source: Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

among the population. Health care expenses consuming 5 percent of gross annual income are generally regarded as a considerable financial burden on most families, and levels of expense upwards of 10 percent suggest substantial risk to financial stability (cf. Berki et al., 1985).

Whether due to large medical expenditures in terms of dollars spent or to low income levels relative to expenditures made, the national average out-of-pocket expense for health care—4.3 percent of annual income in 1977—was exceeded by several population groups (Table 12). Among these were families with an aged household head in 1977, with incomes under \$12,000, and those with Medicare coverage only, a group which con-

sists largely of elderly low-income persons (Cafferata, 1984b; Farley, 1985).

Moreover, for many families high out-of-pocket expense did not necessarily constitute the only outlay for health care. Adding out-of-pocket payments for private health insurance premiums to these expenses to yield total health care outlays raised the 1977 national average to 6.2 percent. Again, families with low incomes and elderly household heads tended to exceed this average. In terms of insurance coverage, this was found for those with private nongroup coverage as well as for the Medicare population both with and without private coverage. Nongroup insurance often costs more and provides lower benefits than group

Table 9. Annual family expenses and sources of payment for personal health services: Mean expense per family with expense and percent paid by source of payment (United States, 1977).

Characteristics of family head	Total families with expense Thousands	Mean expense per family with expense	Source of payment				
			Family	Private health insurance	Medicare	Medicaid	Other ^b
			Percent distribution				
Total^a	75,477	\$1,405	31	34	15	9	11
Age in years							
19 to 24	7,701	636	34	28	0	19	18
25 to 54	41,254	1,275	34	43	2	9	12
55 to 64	11,713	1,753	29	40	10	8	12
65 or older	14,430	1,927	25	15	46	6	8
Sex							
Male	55,852	1,453	32	39	12	5	12
Female	19,625	1,271	27	20	23	21	9
Ethnic/racial background							
White	55,442	1,388	32	37	15	5	11
Black	6,394	1,489	21	27	12	25	15
Hispanic	2,579	1,421	25	28	10	26	11
Family income							
Less than \$12,000	33,346	1,371	26	21	24	16	13
\$12,000 to \$19,999	18,554	1,361	33	43	10	4	10
\$20,000 or more	23,351	1,489	35	46	6	2	11
Education							
Less than 9 years	14,701	1,741	24	21	25	17	12
9 to 11 years	11,954	1,369	29	32	14	12	13
12 years	23,097	1,337	31	43	10	6	10
13 to 15 years	10,494	1,249	35	39	10	3	13
16 or more years	11,374	1,334	41	37	12	1	9

^a Includes families headed by persons of other ethnic/racial groups, of unknown ethnic/racial background, with negative incomes, or with unknown education. ^b Includes CHAMPUS, CHAMPVA, the Indian Health Service, the Veterans Administration, the military, other federal, state, city or county payers, philanthropic institutions, and unknown sources of payment. 0 indicates less than 0.05 percent.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

Table 10. Sources of payment for health care expenses: Percent distribution of families and mean expense for services by levels of total expense per family (United States, 1977).

Level of family expense	Total families with expense	Families at each level of expense	Mean expense at each level	Source of payment				
				Family	Private health insurance	Medicare	Medicaid	Other ^a
	Thousands	Percent		Percent distribution of expense at each level				
All	75,477	100.0	\$1,405	31	34	15	9	11
Less than \$100	9,748	12.9	51	74	12	1	4	9
\$100-249	12,809	17.0	171	70	15	2	6	8
\$250-499	14,531	19.3	36 ^b	65	18	3	6	8
\$500-999	13,618	18.0	711	58	25	3	5	9
\$1,000-2,499	14,154	18.8	1,594	41	37	6	6	10
\$2,500 or more	10,617	14.1	6,205	19	37	21	10	12

^a Includes CHAMPUS/CHAMPVA, the Indian Health Service, the Veterans Administration, the military, other federal, state, city or county payers, philanthropic institutions, and unknown sources of payment.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

insurance (Farley, 1986) because premiums are usually paid entirely by the insured. Thus, families with such policies, even if covered by Medicare, faced deductibles and higher than average copayments, the expense of noncovered services such as prescription drugs, and premiums that averaged \$352 in 1977 (Cafferata, 1984a).

Trends in Health Care Expenditures

Health care price inflation

In this section, NMCES 1977 data are compared with earlier national survey data from Andersen, Lion, and Anderson (1976) to examine health care

patterns and expenditures over a period of considerable health care price inflation.

Gibson (1980) has stated that between 1972 and 1980, health care price inflation "... accounted for 66 percent of the increase in expenditures; population growth accounted for 7 percent, and 'intensity' reflecting changes in quantity and/or composition of goods and services, accounted for the remaining 28 percent." Tables 13 and 14 provide a comparison of the health care expenses of the civilian noninstitutionalized population in 1970 and 1977, based on both 1970 and 1977 actual dollars and on 1970 dollars adjusted for price inflation in the various types of medical care (see Table I).

Based on Gibson's assumptions, while much of the difference between 1970 and 1977 expenses is

Table 11. Sources of payment for health care expenses: Percent distribution of mean expense per service by type of service (United States, 1977).

Type of service	Total families with expense	Mean expense per service	Family	Private health insurance	Medicare	Medicaid	Other ^a
	Thousands			Percent distribution by service			
Outpatient physician	68,245	\$237	49	29	7	7	8
Outpatient hospital	32,049	151	21	36	9	12	23
Inpatient physician	19,616	781	22	41	15	9	13
Inpatient hospital	20,124	2,299	9	43	25	11	12
Prescribed medicines	65,703	85	73	14	—	8	6
Dental	46,689	249	72	18	0	2	7
Other	40,966	151	60	15	6	5	14

^a Includes CHAMPUS/CHAMPVA, the Indian Health Service, the Veterans Administration, the military, other federal, state, city or county payers, philanthropic institutions, and unknown sources of payment. 0 indicates less than 0.05 percent. — Not applicable.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey.

due to health care price inflation, there are differences in the extent to which this affected various types of expenditures. In terms of population age (see Table 13 and Figure 1), increases in health care expenditures observed after adjustment for health care price inflation (HCPI) were particularly noticeable for the population 55 and older. Most of these increases were due to the higher expenditures for hospital inpatient care (both for hospital room and board charges and for physician inpatient care). Mean hospital inpatient expense per capita, after adjustment for inflation, almost doubled between 1970 and 1977 for the elderly, the age group with the highest relative hospital expenses, as well as for those under age 6. Steep increases in inpatient physician expenses occurred for all groups beyond age 18. Hospital outpatient expenses (care in clinics and emergency rooms), although consuming a relatively smaller share of total expenditures, increased at least twofold in all age groups.

Ambulatory physician expenses rose much less. Substantial increases occurred only for three age groups (6 to 17, 35 to 54, and 65 and older), and these increases were on a much smaller scale than observed for hospital expenses. This apparent difference in relative growth between per capita expenditures in the hospital and largely office-based medical sectors was accompanied by much less of a change in prescribed medicine expenses which, as Figure 1 illustrates, increased only marginally for children and in fact decreased slightly for all adult age groups. (See also Rabin, 1983; Firestone, 1977-1980; U.S. Food and Drug Administration, 1981a and 1981b.)

Substantial increases in dental care expenses (likewise adjusted for health care price inflation) were observed only for children and adolescents at risk for orthodontic care (6 to 17 years) and, to a lesser extent, adults 55 to 64 years. Adjusted expenses for other health services (including nonphysician care, vision aids, and medical equipment) showed little increase.

After adjustment for health care price inflation, therefore, the considerable changes in expenditures between 1970 and 1977 were found to be related mainly to hospital inpatient and outpatient facility expenses. In accordance with the suggestion by Gibson (1980), these increases may be attributable either to an increase in services provided—for example, more visits to hospital emergency rooms during the 1970s (National Center for Health Statistics,

1977)—or to changes in the nature or intensity of services—for instance, more outpatient surgery. This observation applies particularly to the very young and the elderly.

The differential effect of medical care price inflation was on the whole less important in expenditures for persons with incomes above poverty than for those below the poverty level (Table 14). With regard to inpatient physician services, over one-third of the difference in expenditures between 1970 and 1977 was due to medical care price inflation for those above poverty, compared to only about 20 percent for those below the poverty line. The respective figures for inpatient hospital services were 54 percent and 36 percent.

Long-term trends

Extending the comparison to the period between 1953 and 1977 indicates that while the 25-year rise in expenditures affected all age groups, differences between the young and old became progressively more pronounced (Table 15). In 1953, mean expenses for the oldest age group were about four times those of the youngest; by 1977 this range had become more than sixfold (Medicaid expenses are excluded from this estimate for reasons of comparability).

The relationship among income groups has changed over the years as well. In 1963, there was little difference by income in mean expenditures (data for 1953 by income are not available). By 1977, mean expenses in the low-income group were 20 percent higher (again excluding expenses covered by Medicaid) and 40 percent higher if Medicaid reimbursements for all age groups are included.

Annual percentage increases (Table 15) were on the order of 5.5 percent between 1953 and 1963 and did not differ substantially by age. By 1963-1970, the total annual rate of increase had risen to 9.3 percent, largely reflecting an almost twofold increase in the rate for children less than 6 years of age and the population over 55. By 1970-1977, the overall annual percentage increase was only about 7 to 8 percent for children less than 6 years and adults 18 to 34 years, but on the order of 15 percent for those 65 years or older. Rates of increase by income, both between 1963-1970 and 1970-1977, also were highest for the low-income group.

Figure 1. Mean expense per person for health services in 1970 and 1977, by age.

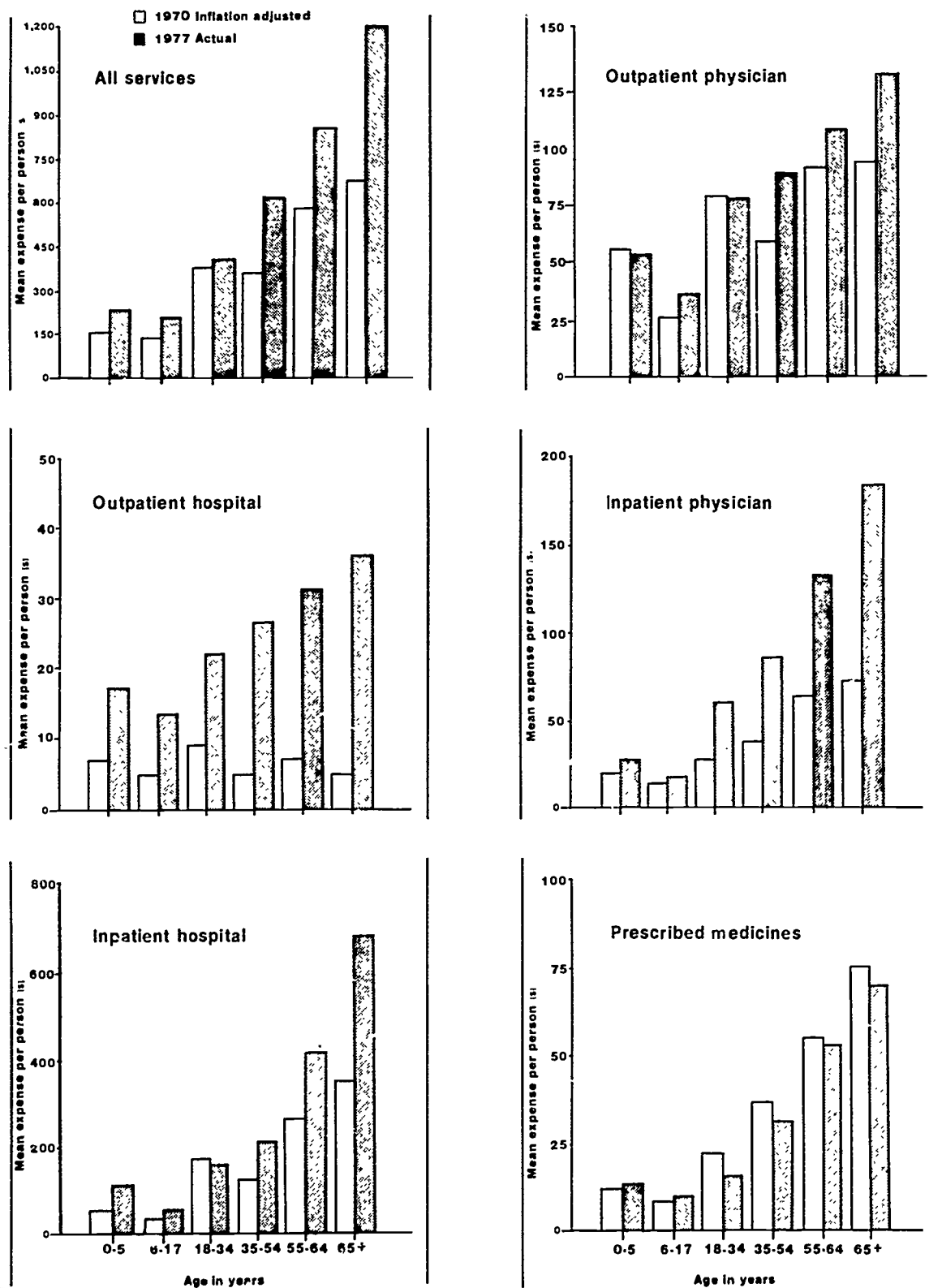


Table 12. Annual out-of-pocket expense for personal health services and private health insurance premiums as a share of family income: Mean percent for families with non-zero family incomes, by selected population characteristics, with standard errors (United States, 1977).

Characteristics of family head	Total families	Out-of-pocket expense for personal health services as percent of family income ^a		Out-of-pocket expense for personal health services and out-of-pocket premiums as percent of family income ^a	
	Thousands	Percent (SE)			
Total^b	73,503	4.3	(0.1)	6.2	(0.2)
Age in years					
19 to 24	6,710	3.7	(0.4)	5.8	(0.5)
25 to 54	40,823	3.4	(0.1)	5.0	(0.2)
55 to 64	11,092	4.4	(0.3)	6.5	(0.3)
65 or older	14,726	6.7	(0.3)	9.3	(0.4)
Sex					
Male	54,165	3.7	(0.1)	5.5	(0.2)
Female	19,338	5.8	(0.3)	8.3	(0.4)
Ethnic/racial background					
White	57,861	4.1	(0.1)	6.1	(0.2)
Black	6,337	3.4	(0.4)	4.9	(0.4)
Hispanic	2,752	3.3	(0.5)	4.6	(0.6)
Family income					
Less than \$12,000	30,991	7.1	(0.3)	10.1	(0.4)
\$12,000 to \$19,000	18,845	2.8	(0.1)	4.4	(0.1)
\$20,000 or more	23,667	1.7	(0.0)	2.5	(0.1)
Education					
Less than 9 years	14,860	5.4	(0.3)	7.2	(0.3)
9 to 11 years	11,433	5.0	(0.3)	7.2	(0.4)
12 years	22,420	3.7	(0.2)	5.7	(0.2)
13 to 15 years	9,998	3.8	(0.2)	5.9	(0.3)
16 or more years	11,340	3.3	(0.3)	5.0	(0.3)
Perceived health status					
Excellent	30,411	3.3	(0.2)	5.2	(0.2)
Good	27,137	4.1	(0.2)	6.1	(0.2)
Fair or poor	13,067	6.6	(0.3)	8.6	(0.4)
Type of insurance					
Private, any group	41,908	2.9	(0.1)	4.7	(0.2)
Private, nongroup	4,433	6.1	(0.5)	11.3	(0.7)
Medicare and private	13,521	6.4	(0.3)	9.7	(0.4)
Medicare only ^c	2,525	8.9	(0.8)	—	—
Medicaid only	3,510	3.9	(0.6)	—	—
Medicare and Medicaid ^c	2,157	4.4	(0.5)	—	—
Uninsured	5,449	5.9	(0.6)	—	—
Region					
Northeast	15,538	4.1	(0.2)	5.8	(0.3)
North Central	20,594	3.8	(0.3)	6.1	(0.3)
South	22,566	4.5	(0.2)	6.6	(0.2)
West	14,805	4.6	(0.3)	6.3	(0.4)
Place of residence					
SMSA	50,775	4.1	(0.2)	5.8	(0.2)
Other	22,728	4.7	(0.2)	7.1	(0.3)

^a Expenses in excess of income are set at 100 percent of income. ^b Includes families headed by persons less than 19 years of age, of other ethnic/racial groups, of unknown ethnic/racial background, and with unknown education. Excludes families with negative or zero income.

^c Does not include Medicare Part B premium. — Not applicable.

Source: National Center for Health Services Research and Health Care Technology Assessment, NMCES Household Survey and Health Insurance/Employer Survey.

Table 13. Distribution of personal health expenses among components of service in 1970 and 1977: Mean expenses per person by age and type of service, in actual dollars and adjusted for medical care price inflation.

Age in years by type of service ^a	Mean			Percent of expenses (unadjusted) within age group	
	1970 actual dollars ^b	1970 dollars inflated to 1977 ^c	1977 actual dollars	1970	1977
Less than 6					
Outpatient physician	\$32	\$54	\$53	33	23
Outpatient hospital	4	7	17	4	7
Inpatient physician	11	19	27	11	12
Inpatient hospital	32	55	106	33	46
Prescribed medicines	9	12	13	10	6
Dental	3	5	7	3	3
Other ^d	5	7	8	5	4
6-17					
Outpatient physician	15	25	38	17	18
Outpatient hospital	3	5	14	3	7
Inpatient physician	7	12	17	8	8
Inpatient hospital	18	31	47	21	23
Prescribed medicines	6	8	9	7	4
Dental	29	45	70	33	34
Other ^d	9	13	13	10	6
18-34					
Outpatient physician	46	78	76	20	19
Outpatient hospital	5	9	22	2	5
Inpatient physician	17	29	58	7	14
Inpatient hospital	94	160	156	40	38
Prescribed medicines	17	22	15	7	4
Dental	33	51	54	14	13
Other ^d	21	31	26	9	6
35-54					
Outpatient physician	35	59	87	15	16
Outpatient hospital	3	5	27	1	5
Inpatient physician	22	37	84	10	16
Inpatient hospital	75	128	205	33	39
Prescribed medicines	28	36	31	12	6
Dental	38	59	63	17	12
Other ^d	25	37	33	11	6
55-64					
Outpatient physician	53	90	105	15	12
Outpatient hospital	4	7	31	1	4
Inpatient physician	38	64	130	11	15
Inpatient hospital	154	263	417	43	49
Prescribed medicines	42	54	53	12	6
Dental	27	42	62	8	7
Other ^d	38	56	46	11	5
65 and over					
Outpatient physician	54	92	127	13	11
Outpatient hospital	3	5	35	1	3
Inpatient physician	42	71	183	10	15
Inpatient hospital	199	340	671	48	56
Prescribed medicines	56	73	69	13	6
Dental	20	31	40	5	3
Other ^d	41	61	67	10	6

^a Type of service data for 1977 was grouped as nearly as possible to 1970 categories. ^b These are survey data adjusted by record data and differ slightly from the 1970 survey data estimates in Table 15. ^c Obtained by applying to 1970 estimates the price deflators developed by Bureau of Data Management and Statistics, HCFA (Gibson, 1980). ^d Includes expenses for nonphysician practitioners, vision aids, and medical equipment and supplies.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey. Data for 1970 are from Andersen, Lion and Anderson, 1976.

Summary

Most of the civilian noninstitutionalized population used at least one major health service during 1977. Inpatient hospital and physician care consumed almost 60 percent of expenditures. On average, persons with expenses for services (only 1 percent of users had no expense) spent \$594 during the year, with both private insurance and public programs each assuming roughly a third overall and the family paying the remainder out of pocket. Both mean expenditures and the relative distribution of sources of payment varied across population groups. Mean annual expense varied in particular by age, income, and education and in conjunction with health status. It was noted that persons in only fair or poor health in 1977 were disproportionately likely to belong to the low-income group regardless of age, putting people with low incomes at a relatively high risk of needing care.

Annual mean expense, both per capita and per person with expense, was higher in the Northeast

and Western region of the country, and private insurance carried a smaller share per capita in both the South and the West compared to the Northeast and North Central regions.

Insurance reimbursements reflected the relative predominance of private coverage among employed male heads of household and their families with incomes above \$12,000 per year. Public program coverage predominated among the elderly through Medicare and among the young as well as among female heads of household through Medicaid. The distribution of sources of payment additionally reflected the structure of benefits, which in the case of private insurance and Medicare emphasize reimbursement of hospital-related expenses.

In all, 15 percent of families with health care expenses incurred annual expenses of \$2,500 or more. Out-of-pocket expenses per family exceeded the national average of 4.3 percent by a substantial and statistically significant margin among the elderly, low-income families, and families with nongroup private insurance, Medicare coverage, or Medicare

Table 14. Distribution of personal health care expenses among components of service in 1970 and 1977: Mean expense per person by poverty level and type of service, in actual dollars and adjusted for medical care price inflation.

Income by type of service ^a	Mean			Percent of expenses (unadjusted) within income group	
	1970 actual dollars ^b	1970 dollars inflated to 1977 ^c	1977 actual dollars	1970	1977
Above poverty level					
Outpatient physician	\$38	\$64	\$77	16	16
Outpatient hospital	4	7	23	2	5
Inpatient physician	24	41	71	10	15
Inpatient hospital	89	152	206	38	42
Prescribed medicines	23	30	26	10	5
Dental	33	51	57	14	12
Other ^d	23	34	28	10	6
Below poverty level					
Outpatient physician	29	49	67	14	12
Outpatient hospital	6	10	25	3	4
Inpatient physician	17	29	79	8	14
Inpatient hospital	101	172	300	49	53
Prescribed medicines	23	30	26	11	5
Dental	14	22	38	7	7
Other ^d	15	23	35	7	6

^a Type of service data for 1977 were grouped as nearly as possible to 1970 categories. ^b These are survey data adjusted by record data and differ slightly from the 1970 survey data estimates in Table 15. ^c Obtained by applying to 1970 estimates the price deflators developed by Bureau of Data Management and Statistics, HCFA (Gibson, 1980). ^d Includes expenses for nonphysician practitioners, vision aids, and medical equipment and supplies.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey. Data for 1970 are from Andersen, Lion, and Anderson, 1976.

supplemented by private insurance. Adding out-of-pocket health insurance premiums (excluding Medicare Part B premiums) to total out-of-pocket expense increased rather than decreased this difference.

A substantial increase in mean expense per person for the period of 1970 to 1977 remains even after adjustment for medical care price inflation by the method suggested by Gibson (1980).

The distribution of expenses changed between 1970 and 1977 because of uneven increases in health expenditures by type of service among age and income groups. Primarily, there was a shift toward a larger percentage of mean per capita expense going to inpatient care and a relative decline in the proportion of expenses going to ambulatory physician care and prescribed medicines.

Table 15. Trends in personal health care expenses, 1953-1977: Mean expense per person and average annual percent increase by age and income.

Age and income	Mean expense per person (including expenses paid by Medicare and Medicaid)			Mean expense per person (excluding Medicaid expenses in 1970 and 1977 but including Medicare) ^a			
	1970 actual dollars	1970 dollars inflated to 1977 ^b	1977 actual dollars	1953 (actual dollars)	1963	1970	1977
Total	\$238	\$388	\$499	\$65	\$112	\$209	\$415
Age in years							
Less than 6	160	261	231	28	47	94	159
6-17	96	156	207	38	56	85	172
18-34	246	401	406	70	124	212	332
35-54	244	398	530	80	151	209	451
55-64	379	618	844	96	165	346	715
65 or older	429	699	1,194	102	184	387	1,002
Family income							
Low	280	456	675	—	95	205	470
Middle	216	352	497	—	105	191	417
High	239	390	431	—	128	228	393
Average annual percent increase							
	1953-63		1963-70		1970-77		
Total	5.6		9.3		10.3		
Age in years							
Less than 6	5.3		10.4		7.8		
6-17	4.0		6.1		10.6		
18-34	5.9		8.0		6.6		
35-54	6.6		4.8		11.6		
55-64	5.6		11.2		10.9		
65 or older	6.1		11.2		14.6		
Family income							
Low	—		11.6		12.6		
Middle	—		8.9		11.8		
High	—		8.6		8.1		

^a Persons for whom Medicaid paid for all care are excluded from 1970 and 1977 for comparison with the years prior to program enactment. Persons on Medicaid with expenditures not covered by Medicaid are included, but only with regard to charges for services not covered by Medicaid. Also excluded are persons who paid for none of their care out of pocket and for whom neither private insurance nor Medicare paid. ^b Obtained by applying the Personal Health Care Price Deflator developed at Bureau of Data Management and Statistics, HCFA (Gibson, 1980). — Not available.

Source: National Center for Health Services Research and Health Care Technology Assessment. NMCES Household Survey. Data for 1953, 1963, and 1970 are from Andersen, Lion, and Anderson, 1976. Variables have been designed to match as nearly as possible those from 1970. ¹ Some percentages have been recalculated.

This was most noticeable for the elderly and for children under age 6.

Although a larger percentage of expenses went for inpatient care in 1977 than in 1970 both for those below and above the poverty level, the poor segment of the population continued to spend a larger proportion on hospital care.

The shifts towards higher expenditures for inpatient care, both relative to other services and in absolute terms, imply increasingly greater disburse-

ment for the older age groups, who are at greatest risk for this type of care. Despite the fact that public program coverage accounted for a substantial portion of third-party payments for care in this age group, the elderly and families with low incomes also faced high direct outlays, both in the form of out-of-pocket expenditures and of health insurance premiums unsupported by outside sources of payment.

Data sources and methods of estimation

Most of the 1977 data in this report were obtained in the household component of the National Medical Care Expenditure Survey (NMCES). The Household Survey elicited information from a sample of approximately 40,000 persons in the civilian noninstitutionalized population on the use of and expenditures for health services in five rounds of interviews and obtained detailed information on demographic and social characteristics of the sample. The survey reference period was January 1 to December 31, 1977. For the interview instruments, see NHCES Instruments and Procedures 1 (Bonham and Corder, 1981).

The survey also inquired into the insurance status of the household sample members. For those reporting private insurance and/or employment in 1977, private insurance status and type of insurance and benefits were verified in the Health Insurance/Employer Survey (HIES) and a substudy, the Unemployed Validation Survey (UVS). Coverage by public programs was not verified but accepted as reported. For HIES data collection instruments, survey procedures, and sampling weights, see NHCES Instruments and Procedures 3 (Cohen and Farley, 1984).

Expenditure data for 1953, 1963, and 1970, which were used for an assessment of relative increases in total health care expenditures within and across individual components of care and by age and income, are from Andersen, Lion, and Anderson (1976). Variables have been designed to match as nearly as possible those from 1970 and some percentages have been recalculated. The 1970 expenditure data in Tables 13 and 14 are survey data adjusted by record data and differ slightly from the corresponding 1970 estimates in Table 15, which are survey data only. NMCES type-of-care survey data have been grouped as nearly as possible to the 1970 categories in Tables 10, 13, and 14; in particular, outpatient hospital facility expenditures were listed separately from other ambulatory care expenses.

Adjustments for medical care price inflation

To permit valid comparison of health care expenditures between 1970 and 1977, the 1970 expenditure data from Andersen, Lion, and Anderson (1976) were adjusted for the rise in prices for

health services by means of a price deflator for health care services developed by Gibson (1980). All 1970 expenditures (or components of expenditures) were converted to 1977 expenditures by dividing 1970 expenditures by the 1970 price deflator divided by 100, as shown in Table 1.

Table 1

Personal health care implicit price deflator	1970 %	1977 %
All personal health care	61.34	100.0
Hospital care	58.60	100.0
Physician services	58.92	100.0
Dental services	64.47	100.0
Other professional services	61.69	100.0
Drugs and medical sundries	77.20	100.0
Eyeglasses, durable medical equipment	67.48	100.0
Nursing home care	59.90	100.0
Other personal health care services	59.60	100.0

Source: Bureau of Data Management and Statistics/Health Care Financing Administration (Gibson, 1980).

This price deflator for personal health care was applied across all age and income categories. However, if the mix of services varied by age or income from that of the total population, the adjustment for inflation that was made may differ from the true rate of inflation for that age or income category. The hospital care deflator was used for both inpatient and outpatient hospital expenses; the physician services deflator for both inpatient and outpatient physician expenses; and the eyeglasses/durable medical equipment deflator for "other" services. The personal health care price deflator includes expenditures for nursing home care, over-the-counter medications, and medical sundries dispensed through retail channels, which are not part of NMCES estimates.

Imputation of missing data

The NMCES estimates in this report of expenditures for ambulatory physician contacts and for inpatient hospital, physician, and related services were supplemented by information obtained from physicians and health care facilities in the Medical Provider Survey

(MPS) of providers of care to household respondents in 1977. Data for MPS sample households were examined for missing total charge or source of payment information and replaced by MPS data when both sources of data identified the same event of care.

Remaining missing or inconsistent data on expenditures for these services as well as missing data for dental and ambulatory nonphysician services, prescribed medicines, eyeglasses or contact lenses, and for medical equipment and supplies were imputed using a method developed at the U.S. Bureau of the Census for their Current Population Report series. This procedure imputes data for individuals with complete information to individuals with missing data but similar characteristics. Variables with known values for all individuals in the survey (age or region, for example) were used to form groups of donors with known data on expenditures and identical groups of recipients with missing data. Within such groups, data were randomly assigned from donors to recipients. The percent of events of care with imputed expenditures for services was approximately 24 percent for ambulatory physician services, 35 percent for inpatient hospital services, 10 percent for dental services, 21 percent for prescribed medicines, 7 percent for medical equipment and supplies, and 27 percent for ambulatory nonphysician services.

Sources of payment

The percent of total annual expense per person with expense borne by different sources of payment was calculated by summing all payments by a specific source and dividing by total expenditures. Averages given for the respective sources do not necessarily reflect actual patterns of payment. For example, Medicaid usually pays either all or none of a specific charge.

When the sum of payments reported for several sources exceeded 100 percent of total annual expenses or of expenses per component of care, the amounts paid by the family out of pocket were reduced to make the sum paid by all sources equal to 100 percent. When the sum of payments reported for all sources was less than 100 percent the remainder was assigned to the "other" source of payment category.

Population characteristics

Families. For the purpose of the estimates in this report, families were defined as households consisting of individuals related by blood, marriage, or adoption. Unrelated individuals residing in the same sample housing unit were treated as distinct single member families. College students who lived away from their original household were treated as separate families.

Family income. Incomes as reported for each member of the family during round 5 of the Household Survey were summed across income types and family members to yield measures of total annual gross family income. The results approximated data from the March 1977 Current Population Survey of the U.S. Bureau of the Census on total income per family and the percent distribution of persons and families by categories of family income. Estimates of income levels exclude those with zero or negative income. For the estimates of health care expenditures as a percent of family income, the expense of 128 families whose expenses were in excess of annual income was set at 100 percent of income as defined in this report.

Poverty level. The definition of poverty level income follows that of the U.S. Bureau of the Census for 1977, using family income within family size categories to establish a poverty line. For the purposes of this report, other income groups were defined as follows in relation to poverty line income: income near the poverty line, from more than 1.00 to 1.25 times, other low income, from more than 1.25 to 2 times, middle income, from more than 2 to 4 times; and high income, greater than 4 times poverty line income in 1977. The poverty line in 1977 for a family of four, for example, was \$6,157.

Race/ethnicity. Classification by ethnic/racial background was developed from a series of questions asked in the round 5 interview. Persons 17 years of age or older were asked if their racial background was best described as American Indian or Alaskan Native; Asian or Pacific Islander; black; white; or other. They also were asked if their main national origin or ancestry was among one of the following:

- Puerto Rican
- Cuban

- Mexican
- Mexicano
- Mexican-American
- Chicano
- Other Latin American
- Other Spanish

This grouping classifies as Hispanic all persons who claimed main national origin or ancestry in one of these Hispanic groups, regardless of racial background. Other persons were then classified as white, black, or other depending on their reported racial background.

These classifications were extended to the population under 17 based on family relationship codes. Persons who dropped out of the survey prior to round 5 were coded as unknown.

Definition of terms

Ambulatory nonphysician services. Any contact with optometrists, psychologists, psychiatric social workers or any other mental health worker, podiatrists, chiropractors, physical therapists, nurses, nurse practitioners, paramedics, home health aides, or physician assistants. A contact with these providers can have occurred in the provider's office, a patient's home, a hospital outpatient department, an emergency room or other medical setting, and includes medical advice over the telephone if a charge was made for these services. Services provided during inpatient hospital stays are not included.

Ambulatory physician services. Any contact with a doctor of medicine (M.D.) or doctor of osteopathy (D.O.) in the physician's office, a patient's home, a hospital outpatient department, emergency room or other medical setting, including medical advice over the telephone if a charge was made for these services. Not included are physician services provided during inpatient hospital stays. For comparisons with 1970 data, ambulatory physician contacts were further separated into outpatient physician and outpatient hospital services categories. *Outpatient hospital services* are ambulatory physician services provided in a hospital outpatient department (clinic) or emergency room, *outpatient physician services* are all other ambulatory physician services as defined above.

Annual health care expenditures. The sum of charges for personal health

services provided during the period January 1 to December 31, 1977.

Dental services. Any visit to a dentist, dental surgeon, oral surgeon, orthodontist, other dental specialist, dental hygienist, dental technician, or any other person for dental care.

Eyeglasses and contact lenses. Purchases and repairs of new or replacement glasses or contact lenses. Not included are examinations by ophthalmologists, which are included in ambulatory physician services, and examinations by optometrists, which are included in ambulatory nonphysician services.

Group insurance. Coverage provided to group members, and often their spouses and children, under a contract between an insurer and a health insurance group, usually an organization such as an employer, a labor union, or a voluntary association.

Hospital services. Stays in short- and long-term facilities listed in the American Hospital Association Guide to the Health Care Field (Chicago: American Hospital Association, 1978 edition). Not included are services by physicians or other medical providers billed separately from the hospital bill or stays in institutional facilities such as nursing homes.

Inpatient physician services. Any service provided by a doctor of medicine (M.D.) or doctor of osteopathy (D.O.) during an inpatient hospital stay but billed separately from the hospital bill, including services by surgeons, anesthesiologists, pathologists, and radiologists.

Medical equipment and supplies. Purchases or rentals of wheel chairs or crutches, corrective shoes, supportive devices, hearing aids, and supplies, syringes, needles, and similar items.

Nongroup insurance. Coverage provided under a contract directly between an insurer and a primary insured person.

Out-of-pocket expense. The share of annual health care expenditures payable or paid by the family that remains after all third-party payments for these expenditures.

Out-of-pocket premium expense. The share of annual premiums for private health insurance coverage payable or paid by the policyholder after third-party payments, such as by employers.

Prescribed medicines. Any kind of drug prescribed by a physician and purchased or otherwise obtained, including refills.

Technical Notes

Sample design

The NMCES sample was designed to produce statistically unbiased national estimates that are representative of the civilian noninstitutionalized population of the United States. To this end, the Household Survey used the national multistage area samples of the Research Triangle Institute and the National Opinion Research Center. Sampling specifications required the selection of about 14,000 households. Data were obtained for about 91 percent of eligible households in the first interview and 82 percent by the fifth interview. Approximately 11 percent of all survey participants provided data for only some of the time in which they were eligible to respond. Information for these respondents was adjusted to account for this partial nonresponse (Cohen, 1982). For a detailed description of the survey sample and of sampling, estimation, and adjustment methods, including weighting for nonresponse and poststratification, see Cohen and Kalsbeek, 1981.

Similar procedures were employed in the HIES to adjust for nonresponse on the part of household sample members and HIES respondents (Cohen and Farley, 1984). Permission forms authorizing contact with employers and insurance carriers in HIES were obtained from approximately 90 percent of household respondents who were the primary insured in either group or non-group plans and from approximately 70 percent of household respondents eligible for the Uninsured Validation Survey. Approximately 16,000 questionnaires were mailed to insurance carriers and insurance groups between October 1978 and August 1979. Responses were obtained for 85 percent of household members who had signed permission forms. For persons under 65, national estimates of private health insurance benefits derived from the short abstracting form are based on a sample of approximately 15,700 individuals, with a sample of approximately 3,400 individuals for items only on the long abstracting form.

Reliability of estimates

Since the statistics presented in this report are based on a sample, they may differ somewhat from the figures that

would have been obtained if a complete census had been taken. This potential difference between sample results and a complete count is the sampling error of the estimate.

The chance that an estimate from the sample would differ from a complete census by less than one standard error is about 68 out of 100. The chance that the difference between the sample estimate and a complete census would be less than twice the standard error is about 95 out of 100.

Tests of statistical significance were used to determine whether differences between population estimates exist at specified levels of confidence or whether they simply occurred by chance. Differences were tested using Z-scores having asymptotic normal properties, based on the rounded figures at the 0.05 level of significance. Unless otherwise noted, only statistically significant differences between estimates are discussed in the text.

Rounding

Estimates as presented in the tables have been rounded to the nearest 0.1 percent and to the nearest dollar.

Standard errors

Standard errors for the statistics in this report were approximated, by interpolation where necessary, using a curve smoothing procedure developed at the National Center for Health Services Research (Cohen, 1979).

Relative standard errors

Totals. Where the statistics of interest are total estimates (T) of the population, of services obtained, or of expenditures, an estimate of the standard error, SE, can be obtained by multiplying the relative standard error, expressed as a percent, of the respective T, RSE(T), by T, and then dividing by 100. Thus,

$$SE(T) = \frac{T(RSE(T))}{100}$$

For estimated population totals of individuals or families, the approximate relative standard errors expressed as percent are as shown in Tables II and III, respectively.

Table II

Estimated population totals for individuals (in thousands)	Relative standard error (%)
500	18.9
1,000	13.5
2,500	8.7
5,000	6.4
10,000	4.8
25,000	3.5
50,000	3.0
100,000	2.6
200,000	2.4

Example: An estimate of 178 million persons in the U.S. population with use of services and expense (212,098,000 x 0.84, Table 1) has a relative standard error of between 2.6 and 2.4 percent (Table II) or, by interpolation, a relative standard error of about 2.4. The standard error of this estimate, then, is

$$SE(T) = \frac{178,162,320(2.4)}{100} = 4,275,896$$

Table III

Estimated population totals for families (in thousands)	Relative standard error (%)
500	12.1
1,000	8.5
2,500	5.7
5,000	4.3
10,000	3.4
25,000	2.7
50,000	2.4
80,000	2.3

For estimated annual expenditures for personal health services, the approximate relative standard errors expressed as percents are shown in Table IV.

Table IV

Estimates of expenditures (in thousands)	Relative standard error (%)
\$250,000	33.2
500,000	23.6
1,000,000	17.0
2,500,000	11.2
5,000,000	8.5
10,000,000	6.7
25,000,000	5.4
50,000,000	4.9
106,000,000	4.6

Ratios. When the statistic of interest is a ratio, Y , such as rate, mean, or percent, both the relative standard error of the numerator, $RSE(N)$, and the relative standard error of the denominator, $RSE(D)$, must be considered. Thus, $Y = N/D$, and the standard error of Y is approximated by:

$$SE(Y) = Y \frac{\sqrt{RSE(N)^2 + RSE(D)^2}}{100}$$

where

$$Y = \frac{\text{total expenses}}{\text{population or number of persons with expense}}$$

for the mean expense per population or per person with expense;

$$Y = \frac{\text{total expenditures for type of service}}{\text{total expenditures for personal health services}}$$

for the percent of expenses attributed to each type of service;

or

$$Y = \frac{\text{total expenditures paid by source of payment}}{\text{total expenditures for personal health services}}$$

for the percent of expenses paid by source of payment.

Example: For the standard error of the mean annual expense for ambulatory physician contacts per person with expense (\$140; Table 4), the relative standard error of the numerator, $RSE(N)$, is 5.8 percent (149,006,000 persons with expense \times \$140 = \$20.9 million, Table IV); and the relative

standard error of the denominator is approximately 2.5 (Table II). Then the standard error is:

$$SE(\$140) = \$140 \frac{\sqrt{(5.8)^2 + (2.5)^2}}{100} = \$8.8$$

Direct standard error estimates

When the statistic of interest is expressed as a person or family based

measure, direct estimates of standard errors have been derived for ease of calculation. For the estimated percent of persons or families with or without expense, approximate standard errors expressed as a percent are as shown in Tables V and VI, respectively. For Table 12, direct estimates of standard errors have been provided.

Table V

Persons in the base of the percent (in thousands)	Estimated percent						
	2 or 98	5 or 95	10 or 90	20 or 80	30 or 70	40 or 60	50
Approximate standard error (in percent)							
1,000	1.9	2.9	4.0	5.3	6.1	6.5	6.6
2,500	1.2	1.8	2.5	3.4	3.8	4.1	4.2
5,000	0.8	1.3	1.8	2.4	2.7	2.9	3.0
10,000	0.6	0.9	1.3	1.7	1.9	2.1	2.1
25,000	0.4	0.6	0.8	1.1	1.2	1.3	1.3
50,000	0.3	0.4	0.6	0.8	0.9	0.9	0.9
100,000	0.2	0.3	0.4	0.5	0.6	0.7	0.7
200,000	0.1	0.2	0.3	0.4	0.4	0.5	0.5

Example: The estimate of 84.0 percent of the U.S. population with expense for personal health services in 1977 is based on a population total of 212,098,000 (Table 1). This estimate has a standard error of approximately 0.4 percent.

Table VI

Families in the base of the percent (in thousands)	Estimated percent						
	2 or 98	5 or 95	10 or 90	20 or 80	30 or 70	40 or 60	50
Approximate standard error (in percent)							
500	1.7	2.6	3.6	4.8	5.5	5.8	6.0
1,000	1.2	1.8	2.5	3.4	3.9	4.1	4.2
2,500	0.7	1.2	1.6	2.1	2.4	2.6	2.7
5,000	0.5	0.8	1.1	1.5	1.7	1.8	1.9
10,000	0.4	0.6	0.8	1.1	1.2	1.3	1.3
25,000	0.2	0.4	0.5	0.7	0.8	0.8	0.8
50,000	0.2	0.3	0.4	0.5	0.5	0.6	0.6
80,000	0.1	0.2	0.3	0.4	0.4	0.5	0.5

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15. Supplementary Notes			
16. Abstract (Limit: 200 words) <p>This report presents data on annual expenses for personal health services and mean health care expense per person by selected demographic and socioeconomic characteristics. The data show that inpatient hospital and physician care consumed almost three-fifths of expenditures during 1977. Persons with expense spent \$594 on the average for health services, with the family private insurance together assuming almost two-thirds of the cost. On an individual basis, females of all ages incurred a higher percentage of out-of-pocket expense than males. Mean expense per person with personal health care expenditures was also higher than the \$594 national average for blacks (\$623); for those with family incomes below \$12,000 (\$756); and for persons living in the Northeast (\$660) and West (\$638). Between 1970 and 1977, increases in health care expenditures after adjustment for health care price inflation were particularly noticeable for the population age 55 and older and for the inpatient component of services. Data were obtained from the 1977 National Medical Care Expenditure Survey, the basis for all reports in the National Health Care Expenditures Study Data Preview series. The survey and data analysis were conducted by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR).</p>			
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